SCHEDULING CLAIM ANALYSIS: A COMPREHENSIVE SCHEDULE RELATED CLAIMS OF CONTRACT ADMINISTRATION FOR CONSTRUCTION INDUSTRY

ZAHIDAH BINTI JAHIDI

Thesis submitted in fulfillment of the requirements
for the award of the degree of
Bachelor of Project Management with Honors

Faculty of Technology

UNIVERSITI MALAYSIA PAHANG

FEBRUARY 2014

ABSTRACT

As the construction industry rapidly grows in Malaysia and contributes to our nation's economic growth, it plays a very important role in the development of our country. The accuracy and completion of the project schedule is important to the early and successful resolution of the schedule delay claim issues. In advance, the causes that contribute to the schedule related claims need to be identified as it will be very helpful in the resolution process from the bottom of the issue. Besides, the adjustment or delay on project schedule that might causes delay claims need to be highlighted by the scheduling practitioners. As this research will study the scheduling claims from the different points of view of project parties (contractors and clients), the questionnaires are extremely critical components as the instrument for this research process. In addition, the data analysis was conducted accordingly from the process of identifying and notifying the contract claims, followed by the determination of the causes of schedule related contract claims and lastly the determination of key elements for a strong schedule related contract claims. The outcomes of this research show that the delays in construction and completion of the contract itself is the main causes that usually lead to a schedule related construction claims. This may due to the incomplete contract, which is the main thing as an agreement in the project. The potential causes to the schedule related contract claims identified in this research are ranked as; 1.Delays in construction and completion of the contract, 2.Incomplete and defective work, and 3.Abnormal or unusual weather conditions. Identify and rank the key elements for a strong schedule related contract claims is the second objective for this research to be conducted. These elements are important in order to obtain a clear and good claim as it is the characteristics that need to be considered and implemented in constructing a schedule related contract claims. The data analyzed find out that the outmost key element that need to be implemented in a strong schedule related contract claims is reviewing and understanding the contract itself in order to determine whether the contract allows for an extension of time and compensation. It means a clear understanding regarding the project's contract will definitely makes a contract claims stronger. While the other key elements identified are ranked as; 1.Review and understand the contract to determine whether the contract allows for an extension of time and compensation, 2.Notice (either actual or constructive) of the delay must be given, and 3.Determination of the critical path is often required for the calculation of delay damages.

ABSTRAK

Industri pembinaan yang pesat membangun di Malaysia juga merupakan penyumbang kepada pertumbuhan ekonomi negara kita. Ketepatan dalam penyiapan jadual projek adalah penting untuk resolusi awal dan penting dalam menanggani isu-isu tuntutan akibat kelewatan jadual. Terlebih dahulu, sebab-sebab yang menyumbang kepada tuntutan berkaitan perlu dikenal pasti kerana ia akan sangat membantu dalam proses penyelesaian dari bahagian bawah isu itu. Selain itu, pelarasan atau kelewatan jadual projek juga mungkin manjadi sebab-sebab kelewatan tuntutan. Kajian ini akan mengkaji tuntutan penjadualan dari pespektif yang berbeza dari pihak projek (kontraktor dan pelanggan), dan soal selidik merupakan komponen yang amat kritikal sebagai instrumen dalam proses kajian ini. Di samping itu, analisis data yang telah dijalankan dengan sewajarnya bermula dari proses mengenal pasti punca-punca tuntutan kontrak jadual yang berkaitan dan akhir sekali penentuan elemen utama bagi tuntutan kontrak. Hasil kajian ini menunjukkan bahawa kelewatan dalam pembinaan dan penyiapan kontrak itu sendiri adalah punca utama yang biasanya membawa kepada tuntutan pembinaan jadual yang berkaitan. Ini mungkin disebabkan kontrak yang tidak lengkap , yang merupakan perkara utama sebagai perjanjian dalam projek tersebut. Punca-punca yang berpotensi untuk tuntutan kontrak jadual berkaitan yang dikenal pasti dalam kajian ini adalah disenaraikan seperti ; 1.Penangguhan dalam pembinaan dan penyiapan kontrak, 2.tidak siap ataupun kerja yang rosak, dan 3.Keadaan cuaca yang luar biasa. Manakala elemen-elemen yang penting dalam usaha untuk mendapatkan tuntutan yang jelas dan baik juga perlu kerana ia adalah ciri-ciri yang perlu dipertimbangkan dan dilaksanakan dalam membina tuntutan kontrak jadual yang berkaitan. Data dianalisis menunjukkan bahawa elemen kunci perlu dilaksanakan dalam kontrak jadual berkaitan serta dengan memahami kontrak itu sendiri untuk menentukan sama ada kontrak itu membolehkan untuk melanjutkan masa dan pampasan. Elemen-elemen utama yang dikenal pasti adalah disenaraikan seperti berikut; 1.Membaca dan memahami kontrak untuk menentukan sama ada kontrak itu membolehkan untuk melanjutkan masa dan pampasan, 2.Notis (sama ada sebenar atau konstruktif) mengenai kelewatan mesti diberi, dan 3. Penentuan laluan kritikal sering diperlukan untuk pengiraan ganti rugi kelewatan.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF ABBREVIATIONS

CI	Construction Industry
CPM	Critical Path Method
GDP	Gross Domestic Product
MYR	Malaysian Ringgit
PERT	Project Evaluation and Review Technique
PMBOK	Project Management Body of Knowledge
PMI	Project Management Institute

CHAPTER 1

INTRODUCTION TO THE RESEARCH

1.1 INTRODUCTION

Every project has unique and different characteristics. However, every each of them have same target towards successfulness by ensuring their client's satisfaction on the project. According to Ashworth (1991) a project is successful if the building is delivered at the right time, at the appropriate price and quality standards. Successful projects are influenced by the project phase's completion by the workforce which is the main resource of a project. As stated in *The Construction Contract Administration Practice Guide (2011),* the successful project is a project that completed on schedule, within budget, and cleared with all claims.

Thus, in order to have a successful project, a project manager needs to avoid any claim that might be issued while completing the project on time. On the other hand, a prolonged or delayed project may lead to the construction claim issued which will affect both client and contractor. Therefore, this research was conducted to study on the schedule related contract claim of a project and the elements that need to be considered in facilitate the preparation of valid schedule related claims in Malaysian construction industry.

1.2 RESEARCH BACKGROUND

The construction industry is well known as a project-based industry in which construction firms form temporary project organizations to develop, perform and complete projects (Loosemore et al., 2006). The project manager in the construction

industry faced numbers of complex activities throughout the project, hence they need to be carefully planned and executed every project phases to avoid any problems happened. Such incident may cause project delay as well as the extended completion duration. Project delay is a nightmare for every project manager since it may lead to construction contract issues such as project prolongation claim. So, it requires extra precaution by outlining the obligations and legal rights for project participators to have an inevitable project outcome (Awad, n.d). Moreover, a contract claim due to project delay can be the largest and most frequent type of claim on construction project (Peter and John, 2009).

On the other hand, Peter and John (2009) mentioned that one of the most common claims in respect of construction contracts is that for additional payment as a result of delays to the contract works resulting in a delay to the contract completion date of that particular project. Thus, in considering of preventing the losses from such time-related cost, a good project negotiator needs to tackle the claim management problems that normally occur starting from the early stage of a project until the project completion.

1.3 PROBLEM STATEMENT

As the construction industry rapidly grows in Malaysia and contributes to our nation's economic growth, it plays a very important role in the development of our country. Unfortunately, construction industry in the country is facing issues such as poor performance of time and cost, construction waste, as well as poor productivity which these may lead to project delay. Intan, Akintoye and Kelly (2009) reported that only 20.5% of the public projects and 33.35% of the private sector projects were completed within the time. Such critical problems in construction industry may lead to issues that might arise in the project contract administration. Furthermore, as claimed by Murali and Yau (2006), disputes, arbitration, litigation, and total abandonment are examples of delay effects.

Therefore, the implementation of the appropriate processes and procedures of the project contract administration will help in facilitating the early resolution of

schedule related disputes and claims (*The Construction Contract Administration Practice Guide*, 2011). The accuracy and completion of the project schedule is important to the early and successful resolution of the schedule delay claim issues. In advance, the causes that contribute to the schedule related claims need to be identified as it will be very helpful in the resolution process from the bottom of the issue.

Besides, the adjustment or delay on project schedule that might causes delay claims need to be highlighted by the scheduling practitioners. Vidogah and Ndekugri (1998) had highlighted problems in claims management such as contractor's management information systems are ill-designed to support claims; products of basic good management practice, such as diaries, timesheets and programmes, often are inadequate in content even if available; and some aspects of the claims are impossible to quantify with a precision even when the best information is available. These problems need to be avoided in preparing for a construction contract claims.

As stated by Jim and Fred (2009) "There are no winners in delay." Both the project owner and the contractors suffer when there is a project delay: the loss of productive use of the project facility or product; increased finance costs both direct and indirectly; extended staffing costs and contractor overheads; the list goes on. If the project is delayed to the stage of dispute resolution, there are the costs for attorneys, claims consultants, depositions, discovery, mediation, arbitration, and litigation. Very rarely will anyone recover the full costs for those time impacts and none of these dispute resolution costs will bring back the project time that was lost. Therefore, professional schedulers need to be more effective in developing and using the Critical Path Method (CPM) schedule as a tool not only to get the project completed on time, but also to communicate to all of the project stakeholders the delay issues.

Furthermore, a schedule delay claim might be very useful and in contract administration and it will be more helpful to identify any potential causes as it can be used to minimize the potential of the project incurring unanticipated schedule related claims. During schedule development as well as by diligently performing specific actions during the project execution phase, the scheduler enables the project to provide

an as-built schedule that can be validated to the project records to be an effective tool to facilitate the preparation for and/or defence of a schedule related claim.

Therefore, this research will be conducted to study on the factors contribute to schedule related claims and look for the main elements of a strong schedule related contract claims.

1.4 RESEARCH OBJECTIVES

The objectives to be met in this study are:

i. To determine the main potential causes of schedule related contract claims.
ii. To identify the key elements in developing strong and firm schedule related contract claims.

1.5 RESEARCH QUESTIONS

This research is conducted to answer questions as following:

i. Does the contract claims affecting the project management process in construction industry?
ii. What are the potential issues that may cause construction contract claims?
iii. Do the schedule related contract claims give advantages in construction contract administration?
iv. What are the key elements in order to obtain a valid and strong schedule related contract claims?
v. Does the Critical Path Method helpful to be used in the schedule related claims in construction contract administration?

1.6 SCOPE OF STUDY

This research is focussing on:

i. Schedule related contract claim only in construction contract administration.
ii. Project scheduling in the construction's project life cycle.
iii. Time matter in project scheduling, without involving price analysis.
iv. Residential construction industry in Bintulu, Sarawak.
v. The potential respondents of this research are parties in a project, which are project clients and contractors.

1.7 SIGNIFICANCE OF RESEARCH

Changes of tasks that normally occur in construction projects such as delays in construction projects need to be monitored properly as it involves every party involved in the agreement and also may bring losses to them. As the changes in project may lead to contractual issues in their business, it needs a strong and valid solution in terms of contractual law in that particular industry. This research of schedule related contract claims in construction industry will benefits construction contract administration practitioners as well as project-related practitioners especially in construction industry as it study varies causes of schedule related contract claim and hence obtaining the key elements of a strong and firm contract claim.

1.8 EXPECTED RESULT

Generally in a project, the clients are the party that gives requirements or request for a project to be done with certain terms and condition. So, in this research, the findings might shows that contract claims will be mostly claimed by the owner against the contractor. This might due to main factors which are; failure of one or more of the parties to perform in a timely manner then thereby delaying the other party, abnormal or unusual weather conditions, project work prolongation, incomplete and defective work and also defects in the design or documentation issued for a project.

In the process of negotiating the claims, the importance of CPM used in schedule related claims in construction contract administration will be proven by the end of this research. It will be more useful by ensuring these elements are implemented in the claims, and there are; a CPM analysis establishes whether or not delay has occurred on the critical path, determination of the critical path is often required for the calculation of delay damages, a contractor should review the contract to determine whether the contract allows for an extension of time or both an extension of time as well as compensation, negotiate or adjudicate the claim, as well as read and understand the contract documents. By having the valid schedule related contract claims for a project, it will helps in improving the project contract management in construction industry in Malaysia.

1.9 SUMMARY

General idea of this research have been explained in this chapter, as it will lead to the deeper elaboration regarding schedule related contract claims in construction industry on the next chapter. The finding of this research would answer the research questions and research objectives as stated.

CHAPTER 2

LITERATURE REVIEW

2.1 INTRODUCTION

This chapter will review and describe on the previous scholar's reviews which related to this research. This research focussed on the scheduling claim of contract administration in the area of project management. This section will discussed on the contribution factors to the sources of construction contract claims, the potential causes of schedule related contract claims and the key elements of obtaining strong and successful schedule related contract claims within the construction industry.

2.2 PROJECT MANAGEMENT

Yang and Wang (2009) claimed that the complexity of the project are getting larger with the professional fields involved in large-scale projects increasing nowadays and the main parties involved in the project construction have increased their effort in ensuring effective construction project management. The purpose is for a win-win situation which is a difficult issue faced by managers at all levels of project management in our country. In addition, a project always involved a single individual or multiple individuals, a single organizational unit, or multiple organizational units from multiple organizations.

Due to the potential for change, the development of the project management plan plays an important role throughout the whole project's life cycle. These progressive and crucial factors involved continuous improvement for a more detailed and specific information as well as more accurate estimates became available.

According to Project Management Institute (PMI) as cited by Brewer Strahorn (2012), this well-structured project management plan may help improve the understanding and practice of project management by identifying, defining, documenting and championing generally accepted project management practices and a common project management lexicon. Hence, it allowed a project management team to define work and manage it to a greater level of detail as the project evolves.

The project management criteria for success however are assessed in terms of project completion within time and budget to the required quality (Pretorius et al. 2007). Nowadays, one of the important issues in Project Management domain is forecasting project time and cost (Iman and Ow, 2009). However, unexpected events and unplanned environmental impact were common during project implementation. Planning, executing, learning and experiencing are tightly connected in the mind-set of project members and managers as the project is truly ambiguous and filled with unexpected events created and things do not unfold as planned or because conditions change over time (So¨derholm, 2008). The scholar also praised the amazing project managers that practicing the art of ‘‘managing the unexpected’’ parallel to executing the plan to cope with changes all the time,.

As example in construction industry, poor performance, such as time delays and cost overruns, and quality defects are not uncommon in construction projects (Meng, 2012 and Lo et al. 2006). Basically, the four most important factors that contributed to this issue has been identified by Mansfield et al. (1994) as finance and payment problems, poor contract management, changes in site conditions, and shortages of materials. On the other hand, Assaf and Al-Hejji (2006) grouped nine categories of delay factors as: project-related, client-related, design-related, contractor-related, consultant-related, materials-related, labor-related, equipment-related, and external factors.

As conclusion, every project is unique as they going through different processes towards completion, and every project aims for a success delivery as scheduled and within budgeted cost. A good project manager needs to tackle any issues that might happen during a project execution. Besides, following an appropriate

guidelines and plan in project management knowledge is important in ensuring a success project.

2.3 CONSTRUCTION INDUSTRY

As reported in International Construction Cost Survey (2012), the construction sector in many countries is now very competitive and tendered prices often come in below budget. The construction industry (CI) has played an important role in the Malaysia economic growth. The industry has been consistently contributed approximately 3% to 5% of the national Gross Domestic Product (GDP) (Shari, 2000, Takim, 2005). Shown below is the list of major projects in Malaysia according to International Construction Cost Survey 2012

Name of major projects	MYR (in billion)
Support for Corridors	853
Greater KL Mass Rapid Transit	40
Kuala Lumpur International Financial District (KLIFD)	26
Development of 1,084 hectare Malaysian Rubber Board Land, Sungai Buloh	10
Warisan Merdeka 100-Storey Tower	5

Table 2.1: Major Projects in Malaysia

As a matter of fact, most of the project faced huge amount of time and cost overrun (Aftab et al., 2012). They claimed that 92% of construction projects were overrun and only 8% of project could achieve completion within contract duration, and the major contributors of this poor performance include design and documentation issues, financial resource management and project management and contract administration issues.

In fact, the management of construction is complex enough without changes, yet it is a familiar characteristic of in construction projects. To effectively manage

change, project managers have to undertake detailed planning; to integrate the work activities of consultants, subcontractors and suppliers. Besides, changes that occur during a project's development may have significant and often unpredictable effects on its organization and management. Thus, project managers must react appropriately to change and understand how it can influence the behaviour of the project system. Only then any changes that happen can be managed effectively.

Knowing that construction project management is a unique discipline with its own tools and techniques, traditional control mechanisms (such as Work Breakdown Structure, Gantt Charts, PERT/CPM networks, Project Crashing Analysis, Trade-off Analysis, etc.) are not entirely adequate for managing complex projects (Lovea et al., 2002). As for the tasks rework in construction project, the two main causes that contribute to this issue are changes and errors in the project. Moreover, design changes are usually introduced to meet the requirements of any of the following customers:

i. Owner - to fulfil their expectations regarding e.g. the operability of the facility;
ii. Contractor - to enhance the constructability of the facility; or
iii. Supplier/fabricator(s) - e.g. to facilitate the use of existing standard products.

Clearly, design and construction changes may contribute to rework which it can take the form of a variation claim if it directly influences a project's progress and causes disruption (Lovea et al., 2002). Furthermore, construction project success is usually measured by four typical success measures; cost, schedule, quality of performance and safety (Hughes et al., 2004). Brown et al. (2001) suggest the major factors contribute to the failure in many construction projects, which include:

i. Lack of integration that may exist between designers and builders;
ii. The use of innovative materials;
iii. The use of incorrect procurement systems;
iv. The condition of the general contracting market; and
v. The inherent "uniqueness" of each new building project

Among all of these factors, most of the researchers agree that are the factor that always happen relate to the labour: Labour supply & Labour productivity. While other factor that also important that causes the delays construction: Shortage of manpower (skilled, semi-skilled and unskilled labour) & Presence of unskilled labour. Besides, Murali and Yau (2007) and Mohd (2010) agreed that normally, when the projects are delayed, they are either extended or accelerated and therefore, incur additional cost.

As a summary, construction industry and project management are inter-related to each other and hence both of these play their role in ensuring the success of the project. Besides that, the project manager should always be ready to wisely respond to any constraints to come whether it is an expected event or unplanned event. The outmost point of this issue is that the project manager need to keep in mind that project delays in construction projects are frequently expensive, since there is usually a construction loan involved which charges interest, management staff dedicated to the project whose costs are time dependent, and on-going inflation in wage and material prices (Mohd, 2010). In addition, it will surely cause contractual issues between client and contractors and hence this may increase unnecessary additional cost into that particular project.

2.4 CONTRACT ADMINISTRATION

The PMBOK (PMI Standards Committee, 2004) emphasized project knowledge areas which procurement is one of the nine main knowledge areas, and suggest several other procurement management processes. These processes include procurement planning, solicitation planning, solicitation, source selection, contract administration, and contract closeout. Project Procurement Management includes the contract management and change control processes required to develop and administer contracts or purchase orders issued by authorized project team members. This shows that a contract is very important in delivering a successful complete project.

A contract in a process plays huge role in a construction project as it is a way of creating a project organization (Turnera and Simister 2001). For instance, the

contract may ensure all works are conducted accordingly to the schedule and hence might help generate project's productivity. As cited from Smith (1996) by Zhao and Yin (2011), a valid contract management can enhance the project management performance about 8 to 20 percent of the actual outcomes. Moreover, contract management is identified by the creation and implementation of all contract documents, the interpretation of which is a highly charged and intense effort. Rarely is the contract administrator able to please all parties (Construction Contract Administration, 2011). Construction management is also requires being a people, equipment, materials, and environment manager.

However, revisions to the plans and specifications require "change orders". Change orders, once approved electronically in Site Manager may be implemented and the approved amount of the contract is modified to reflect the changes. The change order may request additional contract time (Construction Contract Administration, 2011). The Contractor must provide a letter requesting and justifying any additional time. As quoted in Guideline for Establishing Construction Contract Duration (2010), contract time is the maximum time allowed in the contract for completion of all work contained in the contract documents. Contract time often arises as an issue when there is too much time or too little time given in the contract.

As in contract time for a project, if too much time is allowed then the traveling public is being inconvenienced and the contractor does not appear to be aggressively pursuing the work. If not enough time is allowed then the contractor will submit claims for added cost and time to the contract. Besides, contract time also arises as an issue when the traveling public is being inconvenienced and the contractor does not appear to be aggressively pursuing the work. There may be a number of reasons for a project to appear dormant, such as weather limitations, concrete curing times and materials arriving late (Gondy and Hildreth, 2007).

In addition to production rates, the following items should be considered influencing the contract when determining contract time:

i. Effects of maintenance of traffic requirements on scheduling and the sequence of operations
ii. Conflicting operations of adjacent projects, both public and private
iii. Time for reviewing false-work plans, shop drawings, post-tensioning plans, mix designs
iv. Time to obtain necessary permits
v. Restrictions for night-time and weekend operations
vi. Time of the year of the letting as well as duration of the project.

This type of contract time determination techniques generally fall into the categories of bar charts and CPM techniques. Bar Charts are advantageous as they are simple to develop and easy to understand, and they offer a good method of determining contract time. While CPM focuses on the relationship of the critical activities, specifically, those which must be completed before other activities are started.

Furthermore, Shapiro et el. (2005) claimed that conflicts among owners, design professionals and contractors are commonplace due the nature of the construction referred to earlier. Thus, the essential elements in determining contract time for most projects might be very helpful to be implemented in the project management, there are; establishing production rates for all items, adopting production rates to a particular project, understanding potential factors such as business closures, environmental constraints and computation of contract time with a progress schedule or other techniques (Guideline for Establishing Construction Contract Duration, 2010).

As for more specific review, the construction project management basically implementing the construction contract administration which usually begins when the owner-contractor agreement is executed and concludes when final payment is accepted by the contractor. The actual start and completion times of a project are vary and it depends on the specific requirement of the contracts between the contractor and the owner. These services are sometimes provided by third parties. Lenders may have a contract administrator to ensure that the lender's interests are being protected. Construction project management is not the same as construction management since there is an added participant in the process, who may be employed by the owner for pre-

construction services, construction services, or both. The contract documents identify the procedures for communicating during construction, but unless the parties to the contract fully understand their roles, the communication process will not be totally effective (Davison and Mullen, 2009).

In a nutshell, contract administration is an important factor in project performance, as this can be seen from the construction project performance that boosted up by implementing a proper project contract management. Hence, an appropriate project contract management and planning process is crucial in determining project success.

2.5 CONTRACT CLAIMS

It is no doubt that an appropriate project management can increase the organizational efficiency. Moreover, the profits in the organization can increase as well about 3% to 5% through project management; by contrast, the profits will boost 10% to 20% through claim management (He and Chen, 2010). Generally, if the claim opportunities in an engineering project are identified and analyzed early, the success rate of claim is about 93%. Thus, the claim identification in the international project is an important content and segment in the work of the contractor's claim management.

According to Ovegoke (2006), during a construction project, delays may be caused by various factor such as the owner; the contractor. Besides, the act of God may contribute to it, which includes force majeure, unpredictable weather conditions, a loss or a damage occasioned by specified perils, e.g. an earthquake, a flood etc. In such a situation the architect gives a fair and reasonable extension of time to the contractor. While the third party of the project also may contribute, that includes a civil commotion, a local combination of workmen, a strike or a lock-out affecting any of the trades employed upon the works, a delay on the part of the nominated subcontractors or suppliers, a delay in giving instructions to contractor, etc.

In fact, there are 6 main types of claims stated in *Measuring the Efficiency of Construction Claim Administration in Construction Companies in Egypt*. First, claims

concerning the existence or applicability of the contract. Most claims concern matters within the scope of valid contract, but situations may arise outside the scope of contract. It consists of two scenarios: A binding contract was never established initially, and a contract has ceased to bind. For a binding contract to come into existence there must be agreement and intention to create legal relations when the binding contract was never established initially. Problems commonly occur within the pre-contract period. If agreement is eventually reached, the contract refers back to the start of the work. If the contract has ceased to bind it may be declared void by a court due to possible challenges to its validity. Such events rarely happen with standard forms of contract.

Second, claims arising from contract documentation. Assuming the contract is valid, the actual contract documents applicable to that contract and the actual words used in the documents will have a substantial effect on any claim. The contract provisions must be construed as they actually mean. These provisions, however, determine what the obligations and responsibilities of the parties are. Problems of documentations generally occurred as shortcoming documentation where the documents are prepared by people, and people are fallible. Besides, there are also implied terms documentation where the importance of knowing the terms that are implied as standard without neglecting the terms which are not implied, and ambiguities and discrepancies documentation which can arise between documents, or within a given document. Most forms of contract provide powers to resolve ambiguities and discrepancies as regards work to be executed with possible adjustments for payment.

Third, claims arising in connection with execution of the work. Claims arising in connection with the execution of the work concern the occurrence of the actual events, both physical and non-physical, including the discovery that an assumption, as to existing fact at the time of contract, was incorrect. There are three elements of this type of claims. Variations occur when there is a tendency not to appreciate the disruptive effect that a relatively minor variation can have on the work. Risks are the modern conditions of contract allocate risks likely to be met in the course of the work to one party or the other. While Defects is an important function of the employer's appointees is to supervise the work as it ensures that defective work is replaced or rectified before acceptance.